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PLANT IMMIGRANTS.

No. 190. FEBRUARY, 1922.

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300. Tamayo's blackberry bush, northern Ecuador - (*Rubus adenotrichos*).

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE

This circular is made up principally of notes received from agricultural explorers, foreign collaborators, and correspondents, concerning the more important plants which have been received recently by the Office of Foreign Seed and Plant Introduction. It also contains reports on the behavior in the United States of plants which have been introduced in previous years.

Descriptions appearing in Plant Immigrants are revised and published later in the Inventory of Seeds and Plants Imported,--the permanent record of plant introductions made by this Office.

Plant Immigrants should be considered an ANNOUNCEMENT OF THE ARRIVAL OF PLANT MATERIAL. With the exception of seeds received in quantity, all material must be propagated before it is available for experimenters who desire to test it. This requires one to four years, depending upon the plant and the quantity of propagating material imported.

The Annual Catalogue of New Plant Introductions, issued in the autumn, describes briefly the plants which are ready for distribution. Applications for seeds or plants listed in Plant Immigrants may be sent at any time, however, and will be filed in the order of their receipt. When material is ready for distribution, these requests will first be given attention; if their number is sufficient to exhaust the available supply of a given species, it will not be included in the Annual Catalogue.

One of the objects of the Office of Foreign Seed and Plant Introduction is to secure experimental quantities of new or rare foreign seeds or plants for plant breeders and experimenters, and every effort will be made to fill specific requests.

DAVID FAIRCHILD,
Agricultural Explorer in Charge,
Office of Foreign Seed and Plant Introduction.

Issued April 15, 1922.

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Agati grandiflora (Fabaceae), 54468. From Honolulu, Hawaii. Seeds presented by Dr. H.L. Lyon, in charge, Department of Botany and Forestry, Experiment Station, Hawaiian Sugar Planters' Association. "If given plenty of room this plant grows into a tree some 30 feet tall with a trunk diameter of 6 to 8 inches. Seedlings of this tree develop numerous large nodules on their roots at a very early stage in their growth and we have used the species as a green soiling crop, the seeds being planted thickly and the plants turned under when they are 4 to 6 feet tall." (Lyon.)

Bucklandia populnea (Hamamelidaceae), 54692. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. One of the most beautiful of the forest trees of the Sikkim Himalaya, at altitudes of 4,000 to 6,000 feet. The glossy green, leathery leaves are red-veined and red-petioled. The young leaves are more or less deep blood-red, unspotted beneath, but shot with green above. The remarkable, long, red stipules resemble those of the tulip tree (*Liriodendron tulipifera*). (Adapted from Curtis's Botanical Magazine, pl. 6507.)

Bupleurum fruticosum (Apiaceae), 54693. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. "An evergreen, quite hardy shrub." (Proschowsky.)

This ornamental European shrub is interesting because of its densely leafy branches and continuous bloom. The persistent leathery leaves resemble those of some of the shrubby Hypericums in appearance and arrangement. The ends of the branches are tipped with broad umbels of yellow flowers that are in bloom more or less continuously from late April to September. In southern Europe, Syria, and northern Africa, this plant is found growing wild in sterile soil on dry hills. (Adapted from Bonnier, Flore Complète de France, Suisse, et Belgique, vol. 4, p. 13.)

Davidsonia pruriens (Cunoniaceae), 54785. From Brisbane, Queensland. Seeds presented by Mr. C. T. White, Government Botanist. A small (30 to 40 feet) erect tree of graceful habit with long drooping pinnate leaves and pendulous clusters of reddish flowers. The oval fruit, about the size of a goose egg, is covered with short stiff hairs. Rubbing with a rough cloth quickly and easily removes these and exposes the smooth, plumlike, purple skin. The soft fleshy pulp is rich purple and has a sharply acid flavor; it contains a

few flat irregularly shaped seeds which are small for the size of the fruit, – a feature not frequently occurring in wild fruits. This "plum," as it is called, is largely used by settlers in Queensland for making jam and jelly. The hard, dark brown, close-grained wood is tough and durable and is used for tool handles and mallets. This tree is native to tropical Queensland and a smaller form is found in southern Queensland and adjoining parts of New South Wales. (Adapted from Queensland Agricultural Journal, vol. 1, p. 471; and Bailey, Queensland Flora, p. 538.)

Gossypium sp. (Malvaceae), 54501. **Cotton.** From Ceiba, Honduras. Seeds presented by Mr. Alexander K. Sloan, American Consul. "Cotton seeds from the Aguan Valley near Trujillo.

"The natives make very little attempt to cultivate cotton, as the only use they put it to is as a binding for cuts in order to check the flow of blood. As a consequence the bush is undisturbed and grows in the course of six or seven years into a tree some 8 or 10 inches in diameter and from 25 to 30 feet in height. As the tree grows larger, the bolls become smaller and the yield in quantity and quality less. In those places where the native wants to obtain a larger crop than usual, the bush is cut to the ground each year and allowed to reseed itself. In that way the bolls are kept at their largest size." (Sloan.)

Oryza sativa (Poaceae), 54671 and 54672. **Rice.** From Kagoshima, Japan. Seeds presented by Mr. K. Tamari, Kagoshima Imperial College of Agriculture and Forestry.

54671. "Scented rice" from Hioki County.

54672. "Scented rice" from Kimotsuki County.

Pistacia lentiscus (Anacardiaceae), 54694. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. "This shrub is common in southern Europe, forming most of the Mediterranean 'maquis.' It produces a gum used by the Arabs as a perfume. It is always a shrub in the wild state, but I have seen a garden specimen which formed a very beautiful tree 7 to 8 meters (22 to 26 ft.) in height, with a large, dense, rounded crown of beautiful evergreen foliage. The plant will grow in the worst soil and stands any amount of drought." (Proschowsky.)

An edible oil, known as "shinia" (used as a substitute for olive oil), is obtained from the berries.

As prepared by the usual primitive methods the oil does not retain its sweetness for longer than three months after its extraction. The yield is said to be very satisfactory, being about 18 per cent. (Adapted from Cyprus Agricultural Journal,vol.13, pt.1, p.28.)

Quercus lanuginosa (Fagaceae), 54502. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. A large evergreen tree 70 to 80 feet high,native to Kumaon and Bhutan, India, at altitudes of 6,000 to 7,500 feet. The leathery shining leaves are densely clothed beneath with thick soft tawny tomentum. The leaves are used as cattle fodder. Called in Kumaon, "rai banj" (king of the oaks). (Adapted from Brandis, Forest Flora of India, p. 481.)

Rubus sp. (Rosaceae), 54497 and 54498. **Raspberry.** From Corfe Mullen, Wimborne,England. Plants purchased from Mr. J. J. Kettle. Quoted notes from 1921 Catalog of George Bunyard & Co., Maidstone, England.

54497. "'Lloyd George.' This variety is said to be perpetual in habit, to keep a supply of fruit from the earliest season till late autumn, and to be exceedingly vigorous and productive."

54498. "'Perfection' ('Marlboro'). Fruit large, red, of excellent flavor and vigorous growth; canes very stout, bright crimson. Raised by A. J. Caywood, of Marlboro, N. Y.; introduced in 1884, and named by him 'Marlboro.'"

Solanum pierreanum (Solanaceae), 54695. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. "A species with beautiful, large, fire-red long-lasting fruits." (Proschowsky.)

"Olombé." The Pahouins, of Gabon Colony, French Equatorial Africa, eat the brilliant red fruits which are the size of a small walnut and are borne singly or in pairs. The plant is a good ornamental for southern climates. (Adapted from Bulletin de la Société d' Acclimatation de France, vol. 37, p. 483.; and Revue Horticole, vol. 62, p. 343.)

Sollya heterophylla (Pittosporaceae),54696. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. "A beautiful, blue-flowered climber." (Proschowsky.)

This handsome Australian climbing shrub somewhat resembles bittersweet (*Solanum dulcamara*) in habit but

much surpasses that plant in its larger and more beautiful, lilac or purple bell-shaped blossoms in few-flowered clusters which cover the plant with a profusion of bloom in June and July. The red calyxes and pedicels and the persistent dark-green lanceolate leaves form a charming contrast with the flowers. Propagation is by cuttings, layering, and seeds, the last of which are very numerous in the long spindle-shaped pods. (Adapted from Revue d'Horticulture Belge et Etrangère, vol. 21, p. 253.)

Thryallis brasiliensis (Malpighiaceae), 54697. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. An ornamental Brazilian shrub, 12 to 18 inches in height, with opposite leaves and terminal racemes of small yellow flowers. The plant bears a superficial resemblance to some of the small Hypericums. The species of Thryallis are cultivated to some extent in Europe but are little known in America.

Zanthoxylum alatum planispinum (Rutaceae), 54698. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. A Japanese shrub 7 to 13 feet high, much branched at the base, sometimes with a short trunk. The dark brown, spreading branches, drooping a little at the tips, bear stout, straight spines in pairs, and evergreen pinnate leaves dark green above and paler beneath. The small, red, fleshy fruits are persistent and give forth a very agreeable aromatic odor when bruised. The shrub should be more extensively planted as an ornamental; in addition it makes a very formidable hedge. Propagation is by seeds or cuttings. (Adapted from Revue Horticole, vol. 85, p. 17.)

Notes on Behavior of Previous Introductions.

Amygdalus persica nectarina (Amygdalaceae), 34685. From Quetta, India. (Budded on *Amygdalus davidiana* stock.) **Nectarine.** "This nectarine grew very nicely and bears well every year. The fruits, which ripen in July, are very large and richly flavored." (A. D. Polansky, Lyons, Tex., Feb. 25, 1922.)

Annona cherimola (Annonaceae), 44251. From Bogota, Colombia. **Cherimoya.** "The cherimoya matured some fruit last season. These were about 14 ounces in weight and of fine appearance and delicate flavor. I consider it a very satisfactory fruit, for it is of good market

size and the tree is apparently hardy here." (George E. Fairhead, Eagle Rock City, Calif., Mar. 9, 1922.)

Chayota edulis (Cucurbitaceae). **Chayote.** "We picked 243 chayotes of the green variety from one vine. I did not keep track of the number on the other vines which were not as prolific as this one. We consider the green variety far superior to the white ones. The plants are still yielding a small number of fruits, while new fruits are setting in large numbers." (J.O. W. Bailey, Okeelanta, Fla., Feb. 27, 1922.)

Diospyros kaki (Diospyraceae), 13841. **Kaki.** From Yokohama, Japan. (This persimmon is proving of value in California as an unusually late variety.) "In a letter from Mr. W.F. Wight, Plant Introduction Garden, Chico, Calif., received March 11, the following paragraph occurs: 'You will be interested to know that the 'Kuro kuma' persimmon has kept in my laboratory from October until now (March 5) in good eating condition. It might keep, I should say, even a week or ten days longer. It is surely a good variety to lengthen out the season.'

"The 'Kuro kuma' persimmon is to my taste one of the best at Chico. Fruits which have been pollinated are dark fleshed and nonastringent while still hard; if not pollinated, the fruit is light fleshed and astringent while hard." (H.E. Allanson, Mar. 13, 1922.)

Rubus sp. (Rosaceae), 41265. From vicinity of Lungtun, Kiangsu, China. "This plant has succeeded admirably here and I am in great hopes of making it a commercial berry for the South." (E. A. McIlhenny, Avery Island, La., Mar. 13, 1922.)

Tigridia sp. (Iridaceae), 36159. From Chile. "The Tigridias have increased to more than forty-five bulbs. They are so floriferous and the flowers so gorgeously beautiful that I have not had the courage to try eating any of the bulbs." (Mrs. W. D. Diddell, Woodbine, Ga., Mar. 6, 1922.)

Ziziphus jujuba (Rhamnaceae), 17752. From Changli, Chihli, China, and 17892, from Peking, China. **Jujube.** "Both these trees are strong and fast-growing and both fruited heavily in 1921. The fruits are very sweet and of fine flavor; I am very proud of these trees." (A.D. Polansky, Lyons, Tex., Feb. 25, 1922.)

Blackberries and Raspberries Recently Introduced from Central and South America.

"The explorations in Central and South America, which were carried on by the Office of Foreign Seed and Plant Introduction between 1916 and 1921, with the primary object of making a thorough study of the wild and cultivated avocados and securing the most promising ones for trial in those sections of the United States where this fruit can be grown, have resulted in securing, in addition to about thirty-five new avocados and several interesting relatives of this fruit, a number of other useful plants which promise to be of value to our agriculturists and horticulturists.

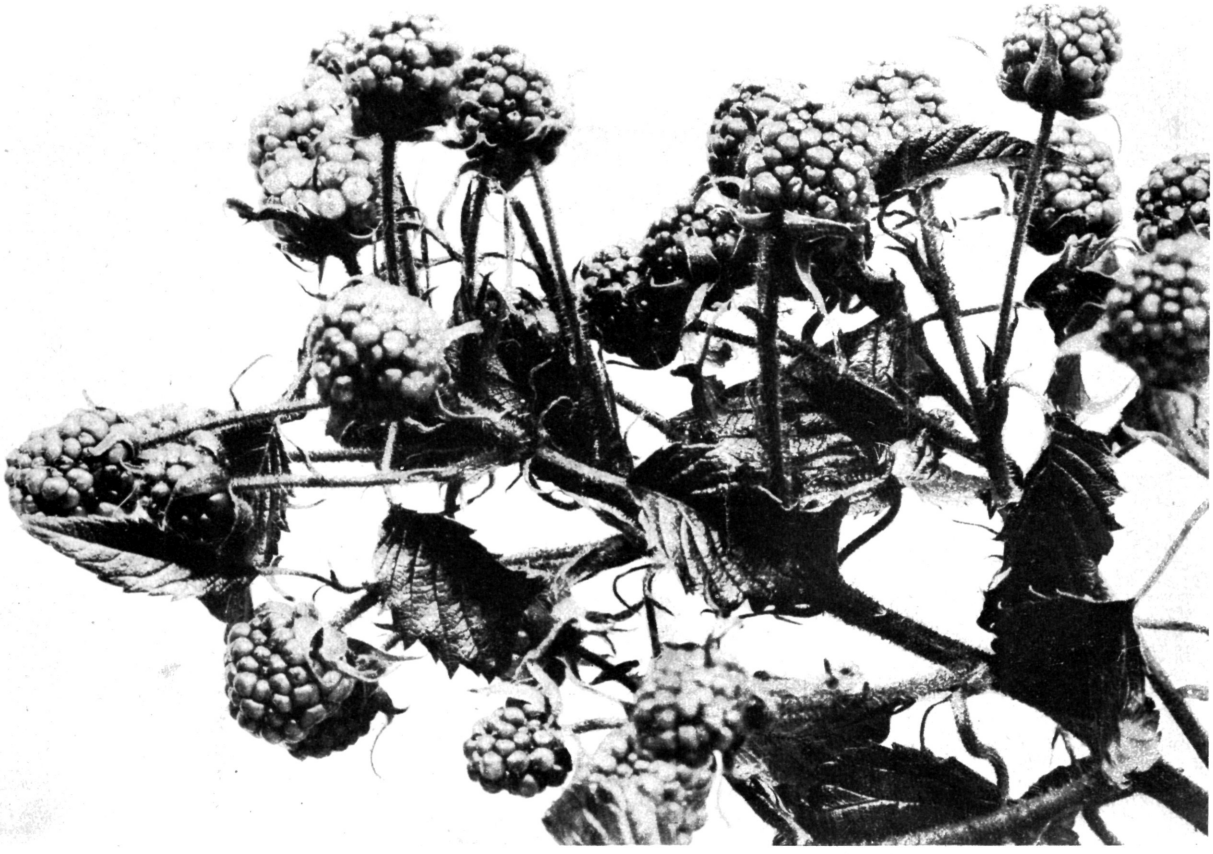
"Among the most interesting of these miscellaneous plants may be mentioned the several species of Rubus obtained in Guatemala, Costa Rica, Colombia, and Ecuador. Two or three of these appear very promising for cultivation in our southern and western states; others are interesting mainly from the standpoint of the plant breeder, who is likely to find in them characters which, when combined with our northern species, will prove of great value.

"Notes regarding these species have appeared in previous issues of Plant Immigrants. At the time when these notes were published, however, some of the species were still unidentified. Furthermore, the observations were all made in the field by one not familiar with the genus Rubus from the plant breeder's standpoint.

"In company with George M. Darrow, of the Office of Horticultural and Pomological Investigations, Bureau of Plant Industry, I have recently gone over the herbarium material of all the species which I collected in Central and South America. Mr. Darrow is devoting most of his time to breeding work with the genera Rubus and Fragaria, and has been particularly interested in securing as many species of Rubus as possible, for crossing with our northern blackberries and raspberries.

"The following notes made by Mr. Darrow and myself may be of interest to others who are devoting attention to this important genus of plants:

"*Rubus adenotrichos* Schlecht. S. P. I. Nos. 49331, 51123, 53219, 53995, 54279, 54280. Collected in several countries, from Guatemala to Ecuador. In the latter a white-fruited form was obtained (S. P. I. No. 54280).



THE CARCHI WHITE BLACKBERRY FROM THE ECUADOREAN ANDES.

(*Rubus adenotrichos* Schlecht., S. P. I. No. 54280.)

This berry comes from the northernmost part of Ecuador, where it is found at elevations above 10,000 feet. It is a vigorous grower, the stout canes reaching to 8 or 10 feet in length. The fruits are cream white in color, soft, and juicy, with small seeds. In flavor they are much like the common blackberry. The plant may prove suitable for cultivation in the Pacific Northwest and in the Gulf States. (Photograph of immature fruits, natural size, by Wilson Popenoe, Hacienda La Rinconada, Province of Carchi, Ecuador, June 9, 1921; P18607FS.)

TAMAYO'S BLACKBERRY BUSH, NORTHERN ECUADOR.

(*Rubus adenotrichos* Schlecht., S. P. I. No. 54279.)

This species is the largest grower of all those which have been introduced from the Andean region. It is also notable for its productivity. The fruits are in terminal clusters sometimes 2 feet long, each cluster containing as many as several hundred berries. The latter are much like the cultivated blackberries of the North in size, color, and flavor. Since the species grows in Ecuador at elevations of 10,000 to 12,000 feet, it may prove sufficiently hardy for cultivation in the Pacific Northwest, California, and the extreme South. (Photographed by Wilson Popenoe, on Sr. J. F. Tamayo's Hacienda La Rinconada, Province of Carchi, Ecuador, June 10, 1921; P18619FS.)

The species is very vigorous, half-trailing in habit, often forming clumps 15 feet high and 20 feet in spread. It is remarkable for its huge fruit-clusters and great productiveness. The fruits are blackberries of good size and quality. Plant breeders in Texas, who are using southern forms of blackberries, close to the dewberry group, should find it of interest.

"*Rubus urticaefolius* Poir. (*R. trichomallus* Schlecht.) S.P.I. Nos.45356,49333,51354. This interesting blackberry was obtained in northern Guatemala, at elevations between 3,000 and 4,000 feet, and also above Esperanza, Colombia, at elevations of 5,000 to 6,000 feet. It makes a large, nearly erect plant, with stout canes heavily clothed with reddish glandular hairs. The fruit-clusters are small, rarely over 5 or 6 inches long: they carry a large number of round, maroon-red berries scarcely half an inch in length. The seeds are so small and soft as not to be troublesome when the fruit is eaten, and the flavor is sweet and very pleasant. This plant is close to some of our southern dewberries, and might advantageously be crossed with them, to secure forms of erect habit and greater fruitfulness.

"*Rubus tuerckheimii* Ryd. S.P.I. No. 49147. From the vicinity of Guatemala City, Guatemala. A species close to *R. adenotrichos* in character, and like the latter, of interest to those breeding the southern forms of blackberries. The fruits are commonly sold in the markets of Guatemala City.

"*Rubus eriocarpus* Liebm. S.P.I. No. 51094. From the upper slopes of the volcano Irazú, in Costa Rica. This is one of the few true raspberries which are found in tropical America, and is of great interest because of the possibility that it will, when crossed with some of our northern raspberries, give rise to new forms which will be suitable for cultivation in our southern states. It is a fruit much like *R. glaucus* in character, but somewhat smaller. The plant also is smaller.

"*Rubus roseus* Poir. S.P.I. Nos. 53186 and 53218. From the highlands of Ecuador. We have named this the 'Tungurahua' raspberry. It is found upon the slopes of the volcano Tungurahua, up to elevations of about 13,000 feet. The plant is half-trailing in habit, forming clumps 5 or 6 feet high; the fruits are an inch

long, broadly conical in outline, and wine-red when fully ripe. They are excellent in quality, and the species seems very promising for crossing with our northern raspberries to obtain large-fruited forms.

"*Rubus macrocarpus* Benth. S.P.I. Nos. 51401, 51706 and 51764, and *R. glaucus* Benth. S.P.I.Nos.49332,49387, 50691,52302,52717,52733,52734 have been fully treated elsewhere (see the Journal of Heredity, vol. 11, No. 5, May - June, 1920; vol. 12, No. 9, November, 1921) and need not be discussed here. It is interesting to note that the former is, by our present standards of classification, a blackberry in growth and character of foliage, but a raspberry in character of fruit, while the latter is a raspberry in growth and leaf characters and a blackberry in fruit. We have named *R. macrocarpus*, therefore, the 'Colombian berry' (to avoid the use of either blackberry or raspberry as part of the name) and the latter (*R.glaucus*) the 'Andes berry.'" (Wilson Popenoe.)

Notes from Agricultural Explorers in the Field.

Mr. J. F. Rock writes from Kengtung, Burma, February 1, 1922:

"On January 30 I arrived at Kengtung,the capital of the southeastern Shan State of the same name. I have been out in the mountains since December 30, traveling with a Haw-Chinese caravan. This place is 25 days' journey from Mandalay and a month from Siam. I have had a most interesting journey over the mountains from Chiengmai to Chiengrai,Chiengsen to Hongluk, thence to Muang Lin;from there I crossed the mountain range between the Meh Len River and the Mekong, descending into the valley of the mighty Mekong. The river bed is very wide but this being the cold season and dry, the water was not very high. The bed is full of enormous boulders and there are many whirlpools and rapids, fine silt and sand in which grows a very interesting vegetation. The forests are mighty, and I must report a fine collection of photographs. On the way over I met an English colonel who was going to Siam on a tour of boundary inspection. I asked him about Chiengtung or Kengtung as it is called up here. He said there is one white man who lives there but he is now away.

"This country is full of chestnuts. I think there are two species of true *Castanea*, different from any I

know. They are large trees, one especially, with a trunk over 3 feet in diameter and a spread like a Banyan. Unfortunately the fruiting season is over; October is the time.

"I collected many specimens and gathered much information. I am sending you from here 13 parcels of plants;I sent six from Chiengrai. There are many more to come, but they are not yet dry. You will find many chestnuts and oaks among them. I took photos of the chestnut trees to give you an idea of them.

"I climbed to the summit of Doi Chang which looks like an elephant in profile, hence the name. On that mountain I found a village of people of Chinese origin. They are called Miao;they do not eat or grow any rice but only corn. They cut down the forests and plant corn at an elevation of 3,500 to 4,000 feet. They are the dirtiest people I ever saw, barring not even the Tibetans. They live with their pigs, the naked children wallowing in the mire with *Sus domestica*. I looked at the heads of some of these people and found their hair full of maggots. It would turn the stomach of anyone. I camped in the woods above them, but they paid me a visit just at breakfast time. There are many idiots among them, evidently due to opium smoking. They are natives of Kweichow Province,China, but have migrated over into Yunnan and even into north Siam. They are the aborigines of China and in the book of Shu King, the oldest historical book of China, dating back over two milleniums before the Christian era,they are mentioned as the Barbarians. They say they have cultivated corn from time immemorial. Their way of living is the most primitive possible. They rarely come to the lowlands, as they dread malaria. Their wants are few,and their main food is corn and pigs. I photographed their village, individual houses, their corn bins, and corn mill. I also sent you their selected seed corn for next year's planting.

"There are several chestnuts on Doi Chang at about 5,800 feet, but I was again too late. I collected material, so we know what there is. I have now struck the wild pear country. On the last day's march to Kentung,the trail led over a mighty mountain pass and there I found many of the sand pear trees in full flower. They looked glorious in the morning sunlight. There were also cherries and plums all wild along brooks. After hunting for sometime I found one tree of the Yunnan pear with fruit,but also in full flower. The fruits were last year's but fresh, and only the

size of a small cherry, which you can see by the specimens I am sending. I am forwarding to you these little pears, packed in charcoal, by registered first class mail. The distance is enormous. All mail is carried overland on pack mules for 25 days, to a railway station at Taunggyi in Burma.

"The mountains have been glorious, the nights very cold but no frost. There is a drop in temperature every day of 50° F., so one feels it. At noon it is about 88° or 90° and in the early morning about 36° or 38°. I have inquired about *Taraktogenos kurzii* on the way and looked out for it but no sign of it anywhere. At Muang Lin I saw a native drug vender who had Kalow seeds, selling five of them for 2 pecks, about one cent; he said they came from Kengtung. I found out that they grow three days' journey from here, and as that is not far, considering the distance I have traveled and will yet have to travel, I shall go there. It is at Man Pangpeng in the hills. I am going from there to Kengtung in Yunnan.

"This is the best way to enter Yunnan, as there is nobody to hinder one. The boundary is a great mountain range, that is all. At Menglen in Chinese territory there is a band of several thousand bandits working but, thank goodness, they are west of where I shall go. Under the present conditions I think it best to spend the coming year in Yunnan to make a reconnoitering trip and go into the chestnut region, for then it will not be a blind chase. I will then know where to go to get them. It is difficult to get carriers from October to the end of December, as that is the rice-harvesting season and all the men are busy in their fields. Once the rice is harvested carriers can be obtained, although many have refused and I was told the reason was that they were not hungry. Before the harvesting season traveling is very difficult, as rice is scarce and people will not sell until the new rice comes in. It is impossible to get paddy for the ponies. So you see there is much that interferes with one's plans.

"As I write now, the sun is about to set, the hills are purple, and the cupolas of the Sawbwas palace,- an imitation of the Taj Mahal but with a board wall in the back,- are still glistening in the sunlight. To my left are the hills (6,000 feet). I shall soon cross into mysterious China."